

CLAIMS

1. An air duct system for a combined refrigerator of the forced air circulation type, comprising a freezing compartment (1) and a refrigerating compartment (2), which are superposed and separated by an intermediate wall (3), further having an air cooling compartment (4) lodging an evaporator (5) and a fan (6) and presenting at least one circulated air inlet (4a) and at least one refrigerated air outlet (4b) directed to the freezing compartment (1) and to the refrigerating compartment (2), characterized in that it comprises a body (10) mounted into the interior of the intermediate wall (3) and defining a rear chamber (11) opened to the circulated air inlet (4a); a transversal through-duct (12) centrally provided in front of the rear chamber (11) and having an end maintained in fluid communication with the refrigerated air outlet (4b), and an opposite end opened to the inside of the refrigerating compartment (2); at least one first and one second return duct (13, 14) each presenting a rear end (13b, 14b) opened to the rear chamber (11) and a front end (13a, 14a) opened to the interior of the freezing compartment (1) and of the refrigerating compartment (2), respectively, the rear ends (13b, 14b) of the first and the second return ducts (13, 14) being positioned on opposite sides of the transversal through-duct (12).
2. The system according to claim 1, characterized in that it comprises a pair of first return ducts (13) disposed along respective opposite lateral regions of the body (10) and having a rear end (13b) opened to the rear chamber (11) and a front end (13a) opened to the inside of one of the

freezing compartment (1) and the refrigerating compartment (2); and a second return duct (14) centrally disposed between the pair of first return ducts (13) and having a front end (14a) opened to the inside of the other of said freezing compartment (1) and refrigerating compartment (2), and a rear end (14b) bifurcated around the transversal through-duct (12) and opened to the rear chamber (11) between the rear ends (13b) of the pair of first return ducts (13).

3. The system according to claim 2, characterized in that the front ends (13a) of the first return ducts (13) are opened to one of the front lower region of the freezing compartment (1) and the front upper region of the refrigerating compartment (2), the front end (14a) of the second return duct (14) being opened to the other of said regions.

4. The system according to claim 2, characterized in that the front ends (13a) of the first return ducts (13) are opened to a face of the body (10) turned to one of the freezing compartment (1) and the refrigerating compartment (2) with which the first return ducts (13) are maintained in fluid communication.

5. The system according to claim 2, characterized in that the rear chamber (11) presents a width corresponding to the width of the circulated air inlet (14a) in the air cooling compartment (4).

6. The system according to claim 5, characterized in that the rear chamber (11) presents a width substantially equal to the width of the body (10).

7. The system according to claim 5, characterized in that the width of the circulated air inlet (4a) is substantially equal to the width of the evaporator (5).

8. The system according to claim 1, characterized in that the first return ducts (13) and the second return duct (14) are substantially coplanar and parallel to each other.

5 9. The system according to claim 1, characterized in that the refrigerated air outlet (4b) of the air cooling compartment (4) is centrally defined, aligned with the fan (6) and opened to the interior of a plenum (7), which is positioned behind the
10 freezing compartment (1) and separated therefrom by a wall (8) provided with openings (9) for the supply of refrigerated air to the freezing compartment (1).

15 10. The system according to claim 9, characterized in that the transversal through-duct (12) has an end opened to the central lower region of the plenum (7).

20 11. The system according to claim 10, characterized in that the transversal through-duct (12) presents a rectilinear development between the central region of plenum (7) and the refrigerating compartment (2).

25 12. The system according to claim 1, characterized in that the body (10) comprises a lower half (10a) and an upper half (10b), which are designed to be fitted into each other, and each defining a respective half of the cross section of the first return ducts (13) and of the second return duct (14), and a respective longitudinal extension of
30 the transversal through-duct (12).

13. The system according to claim 12, characterized in that the lower half (10a) of the body (10) defines the rear chamber (11) in practically the whole extension thereof.